

What is claimed is:

1. A cardiac pacemaker, comprising:
  - a plurality of sensing/pacing channels, each such channel comprising an
  - 5 electrode for disposing near a chamber of a heart, a pulse generator for outputting pacing pulses, and a sense amplifier for detecting sense signals;
  - a controller for controlling the operation of the pulse generators in response to sensed events and lapsed time intervals and in accordance with a programmed pacing mode;
  - 10 an evoked response sensing channel comprising a sense amplifier for sensing an evoked response generated after a pacing pulse;
  - a switching circuit for switching an input of the evoked potential sensing channel to a selected electrode of the sensing/pacing channels;
  - wherein the controller is programmed to perform a capture verification test at a
  - 15 selected time to test a selected sensing/channel for presence or loss of capture, the capture verification test being performed by sensing whether an evoked response occurs during a capture detection window following the output of a pacing pulse; and,
  - wherein the controller is programmed to determine a pacing threshold of a sensing/pacing channel at a selected time by:
    - 20 a) performing a capture verification test on the channel;
    - b) raising or lowering a pacing pulse energy by a specified amount if capture was present or absent, respectively, during the preceding capture verification test;
    - c) repeating the capture verification test with the raised or lowered pacing pulse energy;
    - 25 d) determining the pacing threshold as the unlowered pacing pulse energy if the pacing pulse energy was lowered at step b and a loss of capture occurred during the repeated capture verification test, or repeating steps steps b through d otherwise.

2. The pacemaker of claim 1 comprising sensing/pacing channels for right and left ventricles, wherein the pacemaker is programmed to pace both ventricles during a normal pacing cycle.
- 5 3. The pacemaker of claim 1 wherein the input of the evoked potential sensing channel is switched to an electrode of a sensing/pacing channel other than the channel being tested during a capture verification test.
4. The pacemaker of claim 3 wherein the controller is programmed to output a  
10 backup pacing pulse through a sensing/pacing channel if loss of capture is detected during a capture verification test.
5. The pacemaker of claim 4 wherein the controller is programmed such that the backup pacing pulse is output through a sensing/pacing channel other than the channel  
15 being tested during the capture verification test.
6. The pacemaker of claim 1 wherein the controller is programmed to blank the sense amplifier of the evoked response sensing channel during the capture verification test for a specified blanking period following a pacing pulse output by the tested  
20 sensing/pacing channel, wherein the blanking period is followed by a capture detection window during which an evoked response may be sensed.
7. The pacemaker of claim 1 wherein the pacing pulse energy is raised and lowered by adjusting the duration of the pacing pulse.  
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8. The pacemaker of claim 1 wherein the pacing pulse energy is raised and lowered by adjusting the voltage amplitude of the pacing pulse.

9. The pacemaker of claim 1 wherein the pacemaker is programmed to perform a pacing threshold determination on a selected channel in accordance with commands received via a telemetry link from an external programmer.
- 5 10. The pacemaker of claim 1 wherein the pacemaker is programmed to perform a pacing threshold determination on a selected channel at periodic intervals.
11. A method for determining a pacing threshold for a pacemaker having a plurality of sensing/pacing channels, comprising:
  - 10 a) performing a capture verification test on a selected pacing channel by switching an input of an evoked response sensing channel to an electrode of a sensing/pacing channel with a switching circuit, outputting a pacing pulse through the selected channel, and sensing whether an evoked response occurs during a capture detection window following the output of the pacing pulse;
  - 15 b) raising or lowering a pacing pulse energy by a specified amount if capture was present or absent, respectively, during the preceding capture verification test;
  - c) repeating the capture verification test with the raised or lowered pacing pulse energy; and,
  - d) determining the pacing threshold as the unlowered pacing pulse energy if the  
20 pacing voltage was lowered at step b and a loss of capture occurred during the repeated capture verification test, or repeating steps b through d otherwise.
12. The method of claim 11 wherein the pacemaker is a biventricular device with at least two ventricular sensing/pacing channels and further comprising selecting one  
25 of the ventricular sensing/pacing channels for testing and switching the input of the evoked response sensing channel to an electrode of another ventricular sensing/pacing channel.

13. The method of claim 11 wherein the input of the evoked potential sensing channel is switched to an electrode of a sensing/pacing channel other than the channel being tested during a capture verification test.
- 5 14. The method of claim 13 further comprising outputting a backup pacing pulse through a sensing/pacing channel if loss of capture is detected during a capture verification test.
- 15 15. The method of claim 14 wherein the backup pacing pulse is output through a sensing/pacing channel other than the channel being tested during the capture verification test.
- 15 16. The method of claim 1 further comprising blanking a sense amplifier of the evoked response sensing channel during the capture verification test for a specified blanking period following a pacing pulse output by the tested sensing/pacing channel, wherein the blanking period is followed by a capture detection window during which an evoked response may be sensed.
- 20 17. The method of claim 11 wherein the pacing pulse energy is raised and lowered by adjusting the duration of the pacing pulse.
18. The method of claim 11 wherein the pacing pulse energy is raised and lowered by adjusting the voltage amplitude of the pacing pulse.
- 25 19. The method of claim 11 further comprising performing a pacing threshold determination on a selected channel at periodic intervals.
20. The method of claim 11 further comprising performing a pacing threshold determination on a selected channel in accordance with commands received via a telemetry link from an external programmer.
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